How this investigation fits within the “Concept and Lesson Map”:

**Overview for Unit 3**

“This unit focuses on how the rotation of the Earth causes the apparent movement of the Sun as well as night and day. Students experience two different models of the spin of the Earth, one from and Earth perspective, and another from an outside perspective. Students also model the Earth’s orbit around the Sun over the period of a year.” (GEMS, Space Science Sequence, Introduction, Science Background, Assessment Scoring Guides, page 8)

Overarching question(s) for this whole investigation:

How does the Earth move?

**Attending to “How People Learn”**

How People Learn Key Finding #1: Preconceptions

Eliciting Students Ideas:

Pre-Unit 3 Questionnaire, Session 3.1 Student Sheet: “The pre-unit questionnaire allows teachers to gather information about their students’ possible misconceptions and current understandings of the key concepts in the unit.” See Scoring Guide pages 82-83.

Common Student Preconceptions:

Guidebook for entire kit from GEMS Space Science Sequence, Background, page 38-39.

How People Learn Key Finding #2: Facts/Concepts/Knowledge

WA State Content Standards “Science Domains” (EALR 4):

* **4-5 ES1B** Earth's daily spin relative to the Sun causes night and day.
* **4-5 ES1C** Earth's nearly circular yearly *orbit* around the Sun causes us to see different *constellations* at different times of year.

WA State Content Standards “Science Domains” (EALRs 1-3):

* **4-5 INQF —Models—** A scientific *model* is a simplified representation of an object, event, *system*, or process created to understand some aspect of the *natural world*. When learning from a *model*, it is important to realize that the *model* is not exactly the same as the thing being modeled.
* **4-5 INQG —Explain—** Scientific explanations emphasize *evidence*, have logically consistent arguments, and use known scientific *principles, models*, and *theories*.

Key understandings for the teacher:

See The Key Concept Wall on page 397.

These two questions will help to guide student understandings in this unit:

* Why do the sun and the stars appear to move across the sky?
* What is night and day?

How People Learn Key Finding #3: Metacognition

Metacognition: How did my thinking change? What caused the change? How did I come to believe this?

* The post-unit questionnaires allow teachers to gather information about how students’ ideas and understandings have changed during the unit and to measure progress in students learning. See Post-Unit Questionnaire, Session 3.4 Student Sheet, and Scoring Guide pages 82-85. See *The Post-Unit 3 Questionnaire: How the Earth Moves*, page 406.
* See Guidebook for entire kit from GEMS Space Science Sequence, meaning-making discussions, writing prompts and evidence circles.

Evidence of Student Understanding:

* Pre and Post Questionnaires, Session 3.1 Student Sheet and Session 3.4 Student Sheet, Scoring Guides pages 82-85.

**Additional Information**

See Teacher Considerations sections (odd numbered pages throughout unit).

Materials and Student Management

* See Teacher Considerations sections (odd numbered pages throughout unit).

Timing Considerations

* See Teacher Considerations sections (odd numbered pages throughout unit).